

Architecture
Design
Engineering
Urbanism
Sustainability
Lighting
Acoustics

Building Services Engineering



BDP.

WHO WE ARE

MECHANICAL ENGINEERS

ELECTRICAL ENGINEERS

PUBLIC HEALTH ENGINEERS

LIGHTING DESIGNERS

ACOUSTICIANS

SUSTAINABILITY CONSULTANTS

BUILDING PHYSICISTS

WHAT WE DO

EDUCATION

HEALTHCARE

HERITAGE

HOUSING

LEISURE & CULTURE

RETAIL

SCIENCE, RESEARCH & TECHNOLOGY

SPORT

TRANSPORT

URBANISM

WORKPLACE

CONTENTS

INSPIRATIONAL

EVOLUTIONARY

PRODUCTIVE

CREATIVE

INNOVATIVE

CREATING PLACES FOR PEOPLE

The qualities that set us apart are our regular early strategic involvement in projects, our immediate access to any discipline and the close integration between our engineers and specialists and the innovation that results.

We deliver innovative, low carbon solutions which address the issues of today and the challenges of the future. All our new projects target BREEAM Excellent and we designed the first building in London to achieve BREEAM Outstanding.

Our integrated approach offers mechanical, electrical and public health engineers alongside lighting designers, acousticians, sustainability consultants and ecologists. We work closely with both our in-house architects and external practices.

"PEOPLE FRIENDLY
ENGINEERING."

ANDREW SWAIN-SMITH, CHAIR, BUILDING SERVICES ENGINEERING



INSPIRATIONAL

Educational establishments are the driving force of our economy nurturing the talent of tomorrow and sparking inspiration. We balance the demands of acoustics, ventilation and lighting in classrooms to keep them comfortable and inspire pupils to learn and develop, while for higher education clients we provide intelligent servicing solutions and leading edge sustainability.

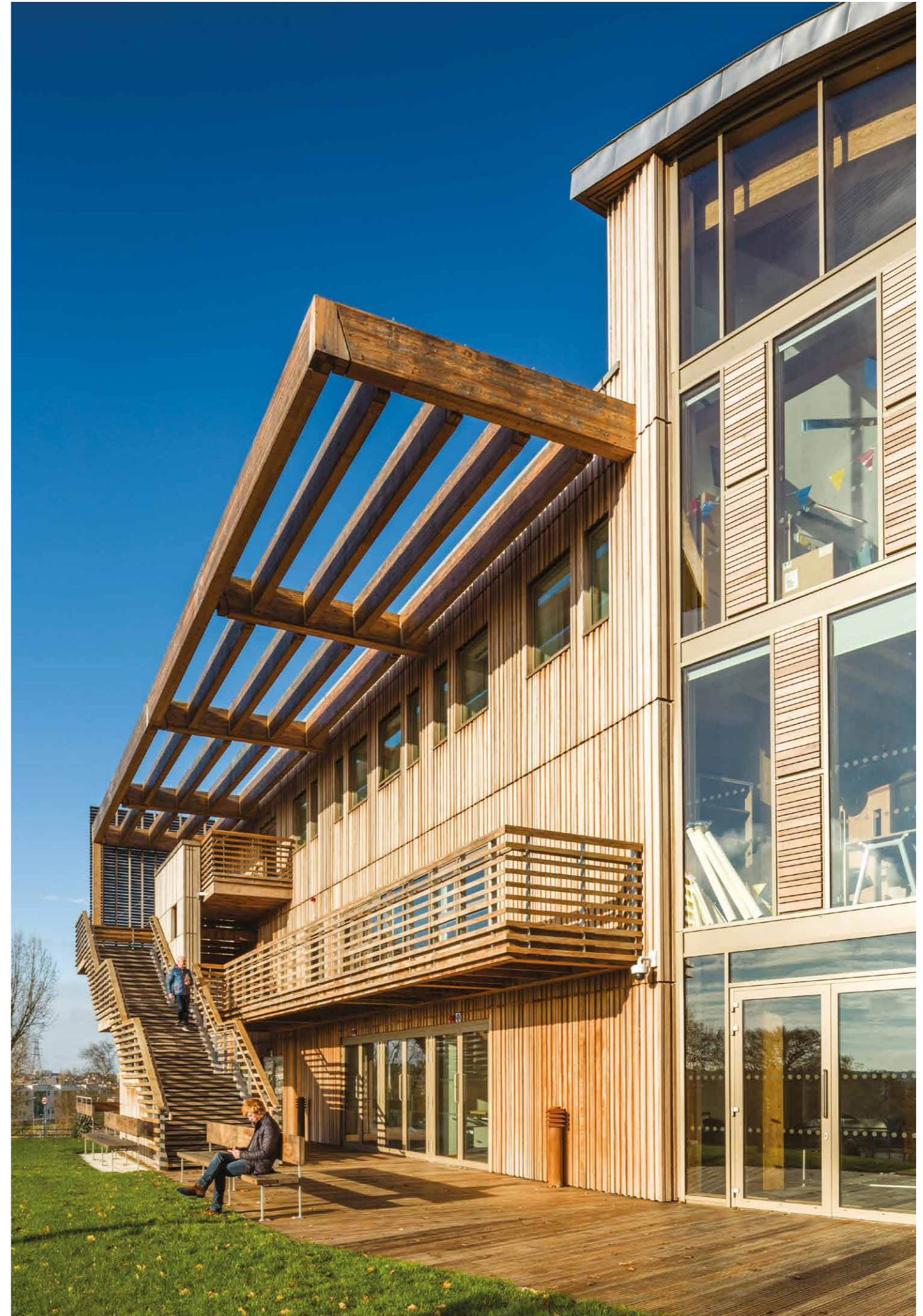
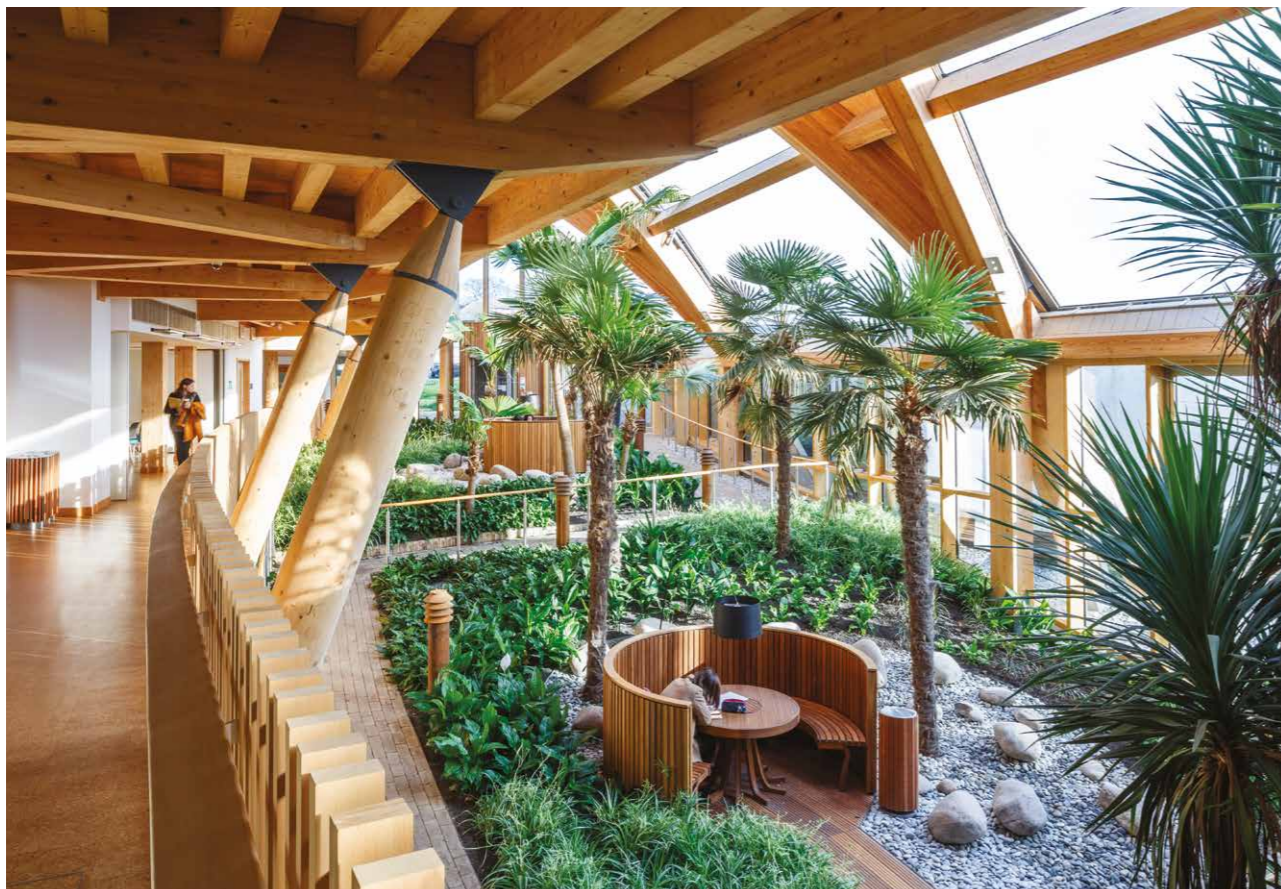
ESSEX BUSINESS SCHOOL
UNIVERSITY OF ROEHAMPTON LIBRARY
ENTERPRISE SOUTH LIVERPOOL ACADEMY
STEBON SCHOOL

ESSEX BUSINESS SCHOOL

The new building is notably low-carbon as part of the school's ethos to lead the development of sustainable business strategies. The centre has an emphasis on postgraduate learning and research, with flexible group learning and media facilities to promote extended community and international links.

The site is located in the Wivenhoe Park on a hillside overlooking the River Colne estuary, forming an important link between the existing 1960s campus and the university's new knowledge gateway research park. The site is surrounded by mature trees relating to the original parkland, which integrates well with the building and landscape design.

The Business School is one of a series of new buildings for the university including the Centre for Democracy and Conflict Resolution and a student centre and library extension designed by other practices.

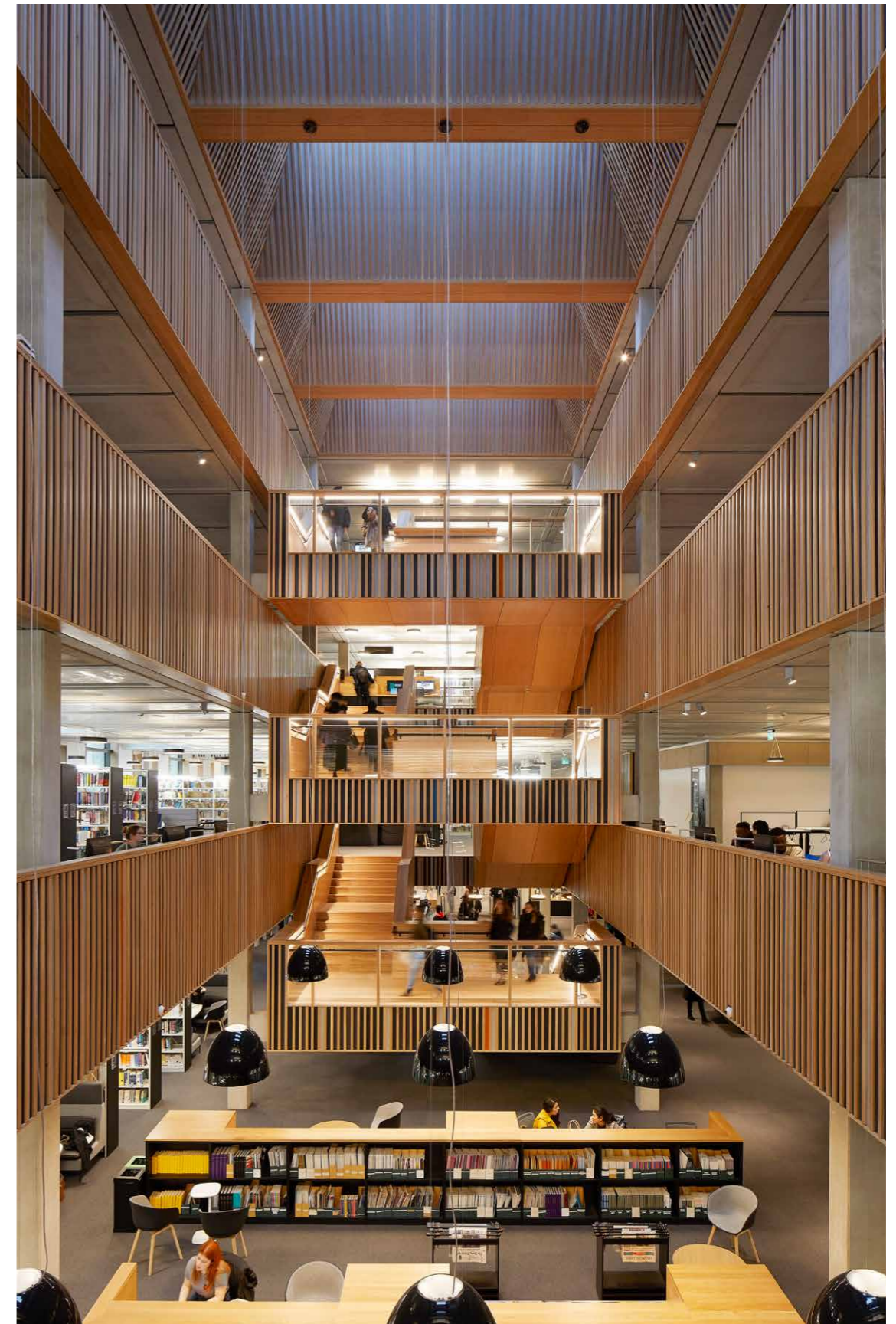


UNIVERSITY OF ROEHAMPTON LIBRARY

University of Roehampton has evolved across four sites over many decades. Sensitively sited within a parkland campus, the new RIBA award winning library is our most recent completion. Home to 800 learning spaces, the building has quickly become the most popular destination on the campus.

Arranged over four levels, with a lower ground floor refectory, the building is BREEAM Excellent and has many sustainable features. Cooling is delivered by cast-in pipework in the exposed concrete soffit, and the library is linked to a CHP energy centre installed as part of the adjacent Elm Grove student residences, also engineered by us.

The building adopts a mixed-mode ventilation approach, low energy LED lighting strategy and rooftop PV array. The project has followed the BSRIA Soft-Landings process and we are currently completing the first year of a formal Post Occupancy Evaluation.



THE ENTERPRISE AND SOUTH LIVERPOOL ACADEMY

A symbol of regeneration.

This new academy is conceived as a ribbon, clad in shiny aluminium shingles. The form provides a strong visual presence for the entrance vista and rises up to the main body of the building before wrapping around and down to enclose the learning spaces.

The ribbon unites the four main parts of the academy, its form defining and enclosing the external community piazza and an internal central heartspace.

Passive design strategies such as building orientation maximise the natural daylight levels whilst minimising solar heat gains. Earth tubes and exposed concrete soffits use thermal mass to reduce energy peak demands.

"A BUILDING
TOTALLY
FIT FOR
PURPOSE."

JACK PENDLEBURY, PRINCIPAL

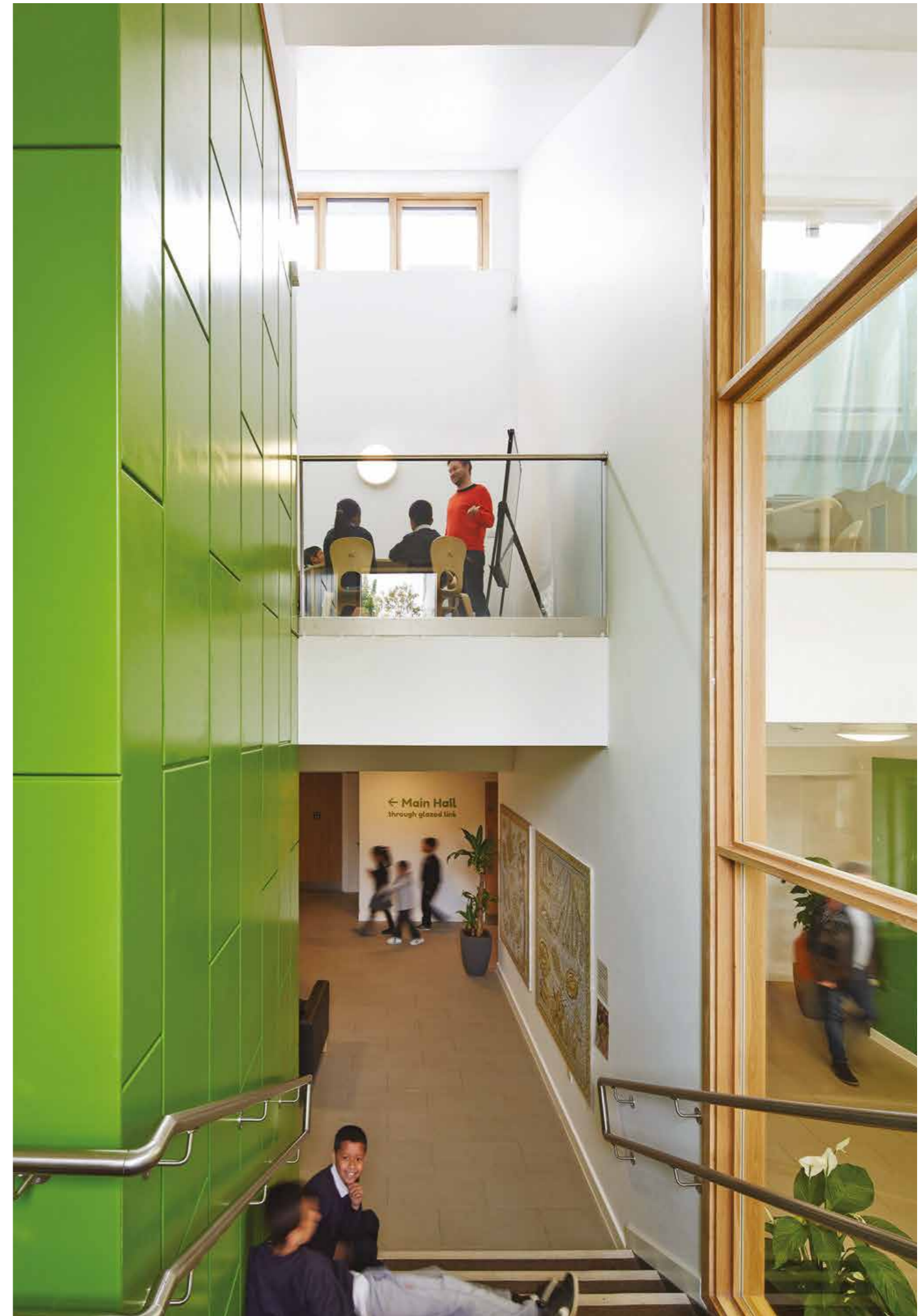


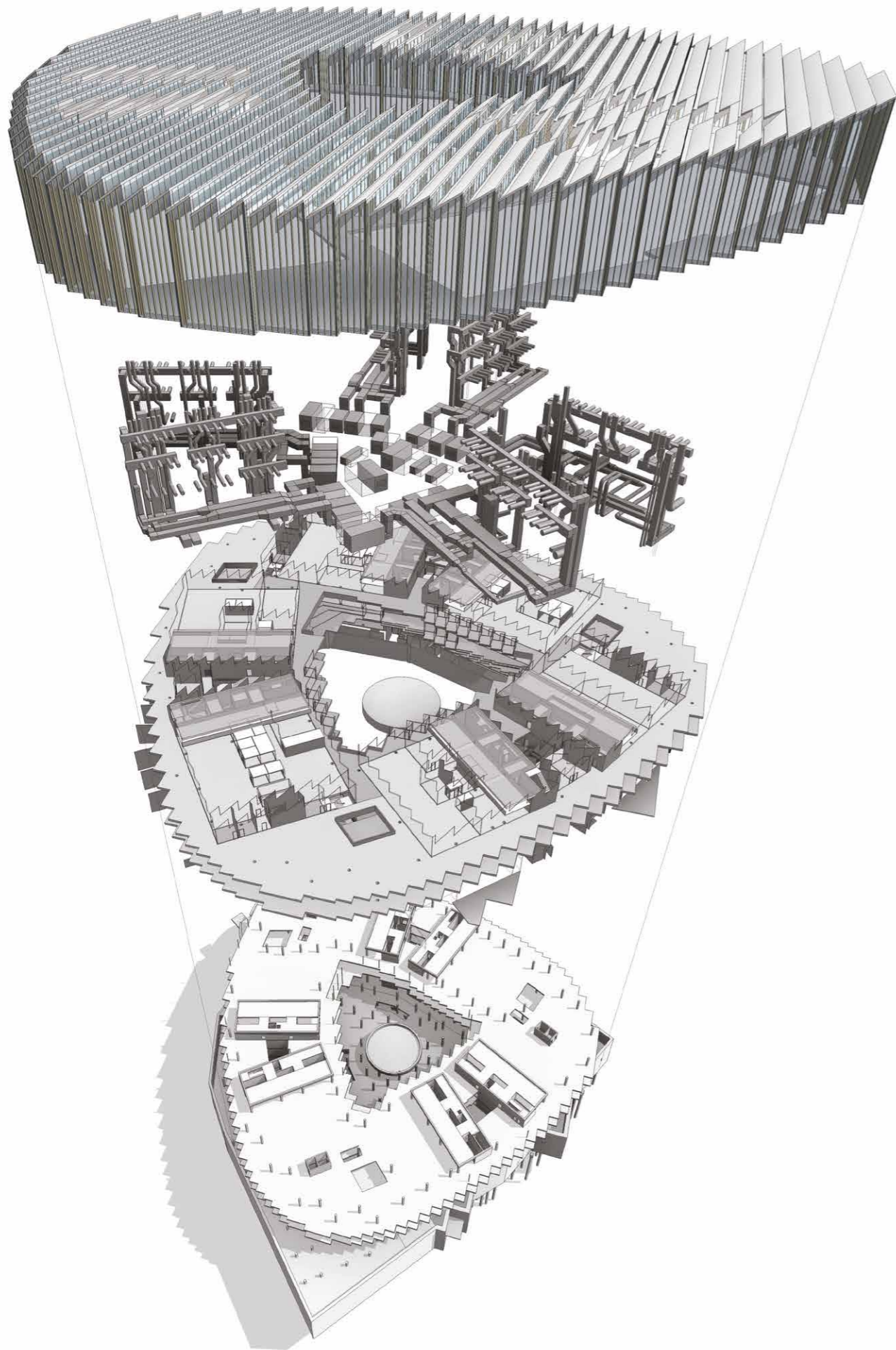
STEBON SCHOOL

This exciting expansion of an inner London primary school provides a new, two storey classroom block attached to the existing school by a glazed link, increasing the number of pupils and improving the overall layout and operation of the school.

Constructed to strict Passivhaus environmental standards, the new classroom block takes advantage of passive solar gain and is predicted to yield energy savings of up to 80% compared with standard construction.

The new build school extension has a mixed mode ventilation strategy, with natural ventilation via windows, vents and rooflights supplemented by mechanical supply and extract ventilation with heat recovery when conditions suit. The highly insulated airtight building makes maximum use of solar gain in winter and the large brise-soleil on the south façade controls summer solar gain whilst allowing beneficial solar gain in the winter.





EVOLUTIONARY

We collaborate with our clients to realise their aspirations at the cutting edge of research and development, to provide environments that inspire and foster world class innovation and discovery in the field of life sciences. This industry is undergoing rapid evolution with the changing space types needed for bench to bed translational medicine, multi-disciplined research and teamworking, rapid advances in IT and data handling, shared support services and optimum use of space.

ASTRAZENECA GLOBAL R&D CENTRE AND CORPORATE HQ
PEARS BUILDING LABORATORY AT ROYAL FREE HOSPITAL
UNIVERSITY OF CENTRAL LANCASHIRE
ROYAL ALEXANDRA CHILDREN'S HOSPITAL

ASTRAZENECA HEADQUARTERS

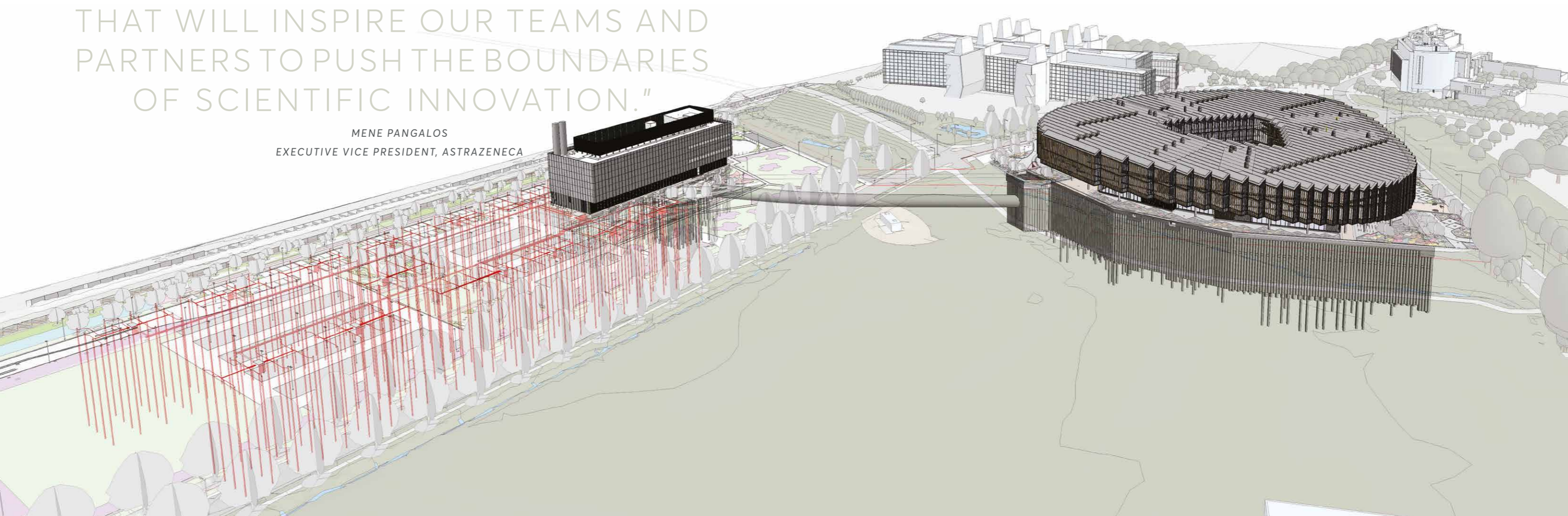
We are lead consultant for AstraZeneca's new 60,000sqm Global R&D Centre and Corporate Headquarters. Our building services and structural engineers, lighting designers, acousticians and sustainability consultants are responsible for providing an all through comprehensive engineering design service, working with Herzog and de Meuron and our architects in their executive role.

A central hub of labs will form the focal point for the centre, which will encourage collaborative working across the organisation and provide easy access for the wider scientific community through an open design and campus environment.

The BREEAM Excellent design includes a wide range of low carbon technologies including, at the heart of the energy design, one of Europe's largest vertical closed loop borehole arrays of its type, coupled to ground source heat pumps, CHP plant and low energy top up heating and cooling plant, providing extensive renewable energy to support this technologically complex building.

"OUR AIM IS TO CREATE AN OPEN, WELCOMING AND VIBRANT CENTRE THAT WILL INSPIRE OUR TEAMS AND PARTNERS TO PUSH THE BOUNDARIES OF SCIENTIFIC INNOVATION."

MENE PANGALOS
EXECUTIVE VICE PRESIDENT, ASTRAZENECA





Images courtesy of Herzog and de Meuron

INSTITUTE OF IMMUNITY AND
TRANSPLANTATION, PEARS BUILDING
AT ROYAL FREE HOSPITAL

The Pears building will house the Institute of Immunity and Transplantation, a world-class research centre into some of the world's most serious diseases.

The light-filled interior has been designed to foster enhanced interaction amongst researchers, with research facilities and supporting space making the heart of the institute a vibrant international hub for clinical research.

Designed to achieve BREEAM Excellent, it will make a positive contribution to the local character of Hampstead, with sensitive massing and façades together with engagement with and incorporation into the surrounding landscape.



© Hayes Davidson



© Hopkins Architects

UNIVERSITY OF CENTRAL LANCASHIRE

The Engineering Innovation Centre (EIC) will be a state of the art facility, equipped to a high quality standard, on the Preston campus. Its aim is to exploit the location of the university at the centre of one of the most intense engineering and manufacturing areas in the UK and establish UCLan as a leader in engineering innovation.

The Engineering Innovation Centre will create an integrated space for teaching, research and knowledge exchange, resulting in higher education provision in Lancashire which more closely reflects the economic priorities of the business community. The EIC will boost levels of innovation through increased knowledge exchange activity with business, both SMEs and larger business, nationally and internationally.

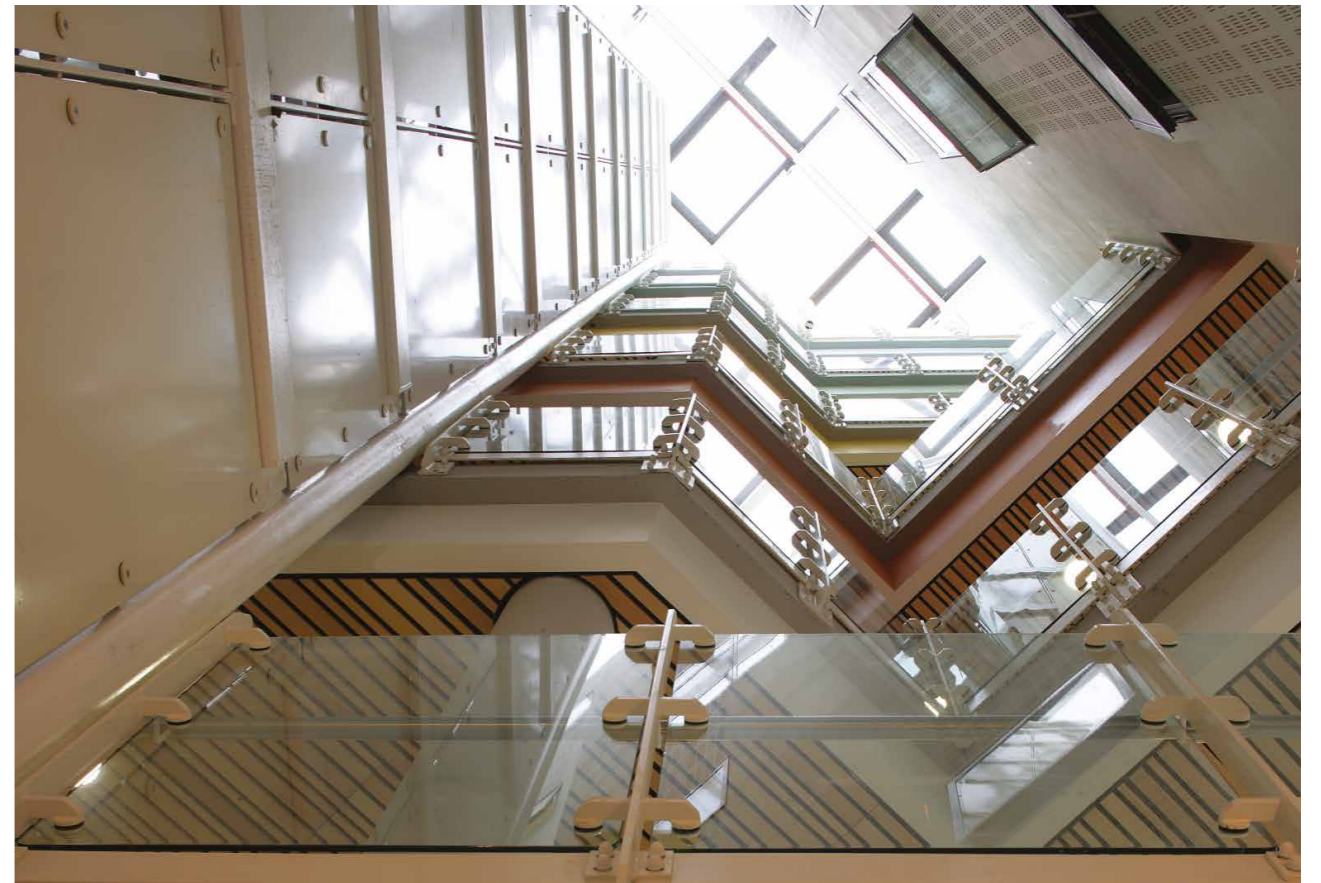
The new facility will accommodate the building services engineering teaching and research functions. A range of renewable technologies, including micro CHP, PV and heat pumps has been integrated into the building. EPC A rated, extensive thermal modelling has been undertaken to ensure optimisation of the balance between building comfort and energy consumption.



ROYAL ALEXANDRA CHILDREN'S HOSPITAL, BRIGHTON

The new hospital is one of only seven dedicated paediatric hospitals in the UK. The top decks are the family and children's domain with the parents' accommodation and play centre opening out onto playdecks that enjoy the sea and sun. The staff lounge and doctors' mess were also located at the top, so that staff can have a break from the clinical environment and take some air. At the centre of the hospital the atrium binds all levels together and ensures good daylight throughout.

Our user and children-centred approach extended to all aspects of the design, from our clinical-planning studies which led to our departmental organisation, placing inpatients above and outpatients below clinical support, and ward layouts which place all the bedrooms on the sea-view side, to thoughts about the development of lighting, user-friendly environmental controls and child-scaled furniture and windows.





PRODUCTIVE

The modern workplace needs to foster creativity and productivity among its workforce, offering flexible space adaptable to ever changing needs. Clients are also demanding office buildings that can be seen as symbols of a company's sustainability credentials.

NORTHAMPTONSHIRE COUNTY COUNCIL HEADQUARTERS
7 MORE LONDON
MANCHESTER TOWN HALL

NORTHAMPTONSHIRE COUNTY COUNCIL HEADQUARTERS

One Angel Square for Northamptonshire County Council (NCC) forms part of an overarching change and growth agenda which is taking place in Northampton. The new building is the central hub accommodating around 2000 employees of NCC directorates that were previously located at a number of different locations.

The council's vision is that One Angel Square will provide an environment for a new generation of work styles and collaborative working to bring with it new and effective work processes for improved productivity.

The project has exceeded expectations – with a BREEAM Excellent rating and EPC-B rating, energy use is within predicted levels. The project is a BSRIA Soft Landings project and we will be reviewing its performance over the next three years. Feedback has been fantastic with users commenting on the bright and airy feel of the building.



"THE PERFECT MIX OF PRIVATE AND COMMUNAL AREAS RESPONDING TO HOW YOU WISH TO WORK, AMONGST OTHERS OR ON YOUR OWN, THIS ENVIRONMENT CAN CATER FOR EACH INDIVIDUAL NEED."

GRAHAM MCCLEMENTS, HEAD OF WORKPLACE

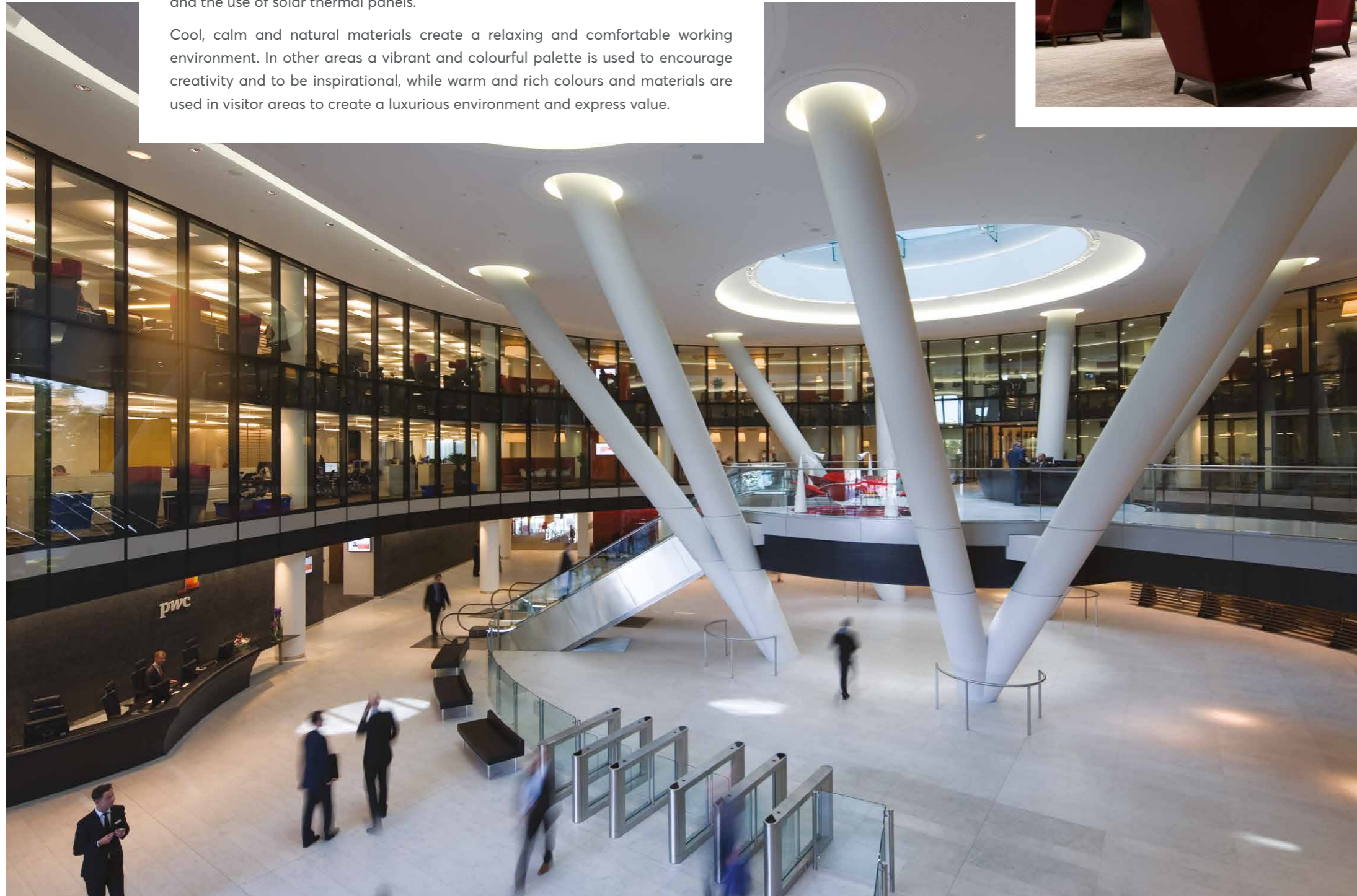


PWC 7 MORE LONDON

Our design team, who provided building services and internal fit-out, held a pivotal role in the collaboration process of this job, working closely from the outset with PwC, the developer (More London) and its team including the architect Foster and Partners and the contractor Mace.

The building includes environmental innovations such as the use of 80% recycled aggregate within the concrete used and the recycling of waste heat to cool and warm the building with 25% of energy produced on site using recycled cooking oil and the use of solar thermal panels.

Cool, calm and natural materials create a relaxing and comfortable working environment. In other areas a vibrant and colourful palette is used to encourage creativity and to be inspirational, while warm and rich colours and materials are used in visitor areas to create a luxurious environment and express value.



"WE HAD THE OPPORTUNITY WITH THE DESIGN PROCESS FOR THE BUILDING, TO TAKE A BLANK SHEET OF PAPER AND RAISE THE BAR, BOTH FOR OURSELVES AND OTHERS, IN THE ENVIRONMENTAL AND SUSTAINABILITY PERFORMANCE OF OFFICE BUILDINGS. THIS ASSESSMENT SENDS A REALLY CLEAR MESSAGE THAT PLANNING FOR THE SUSTAINABLE USE OF RESOURCES, IN DETAIL AND RIGHT THROUGH THE PROCESS, CAN MAKE GOOD BUSINESS SENSE."

ROGER REEVES, PARTNER, PWC

MANCHESTER TOWN HALL

Our commission included the design of mechanical, electrical and public health services with specialist lighting and acoustics input and a focus on centralised energy generation.

The Central Reference Library is the largest and most popular library in Manchester. The building also contains historic archives and exhibition space for the historic films collection.

The Town Hall Extension houses office areas, a council chamber and associated members and committee rooms, a customer services centre at ground floor level and a city library at basement level complete with a restaurant area.





CREATIVE

An understanding of people and how the public interacts with buildings, is critical to creating successful cultural projects. Our engineers creatively retain and refurbish much loved existing buildings, preserving and enhancing their character whilst discreetly adapting them to make them fit for purpose in the 21st century.

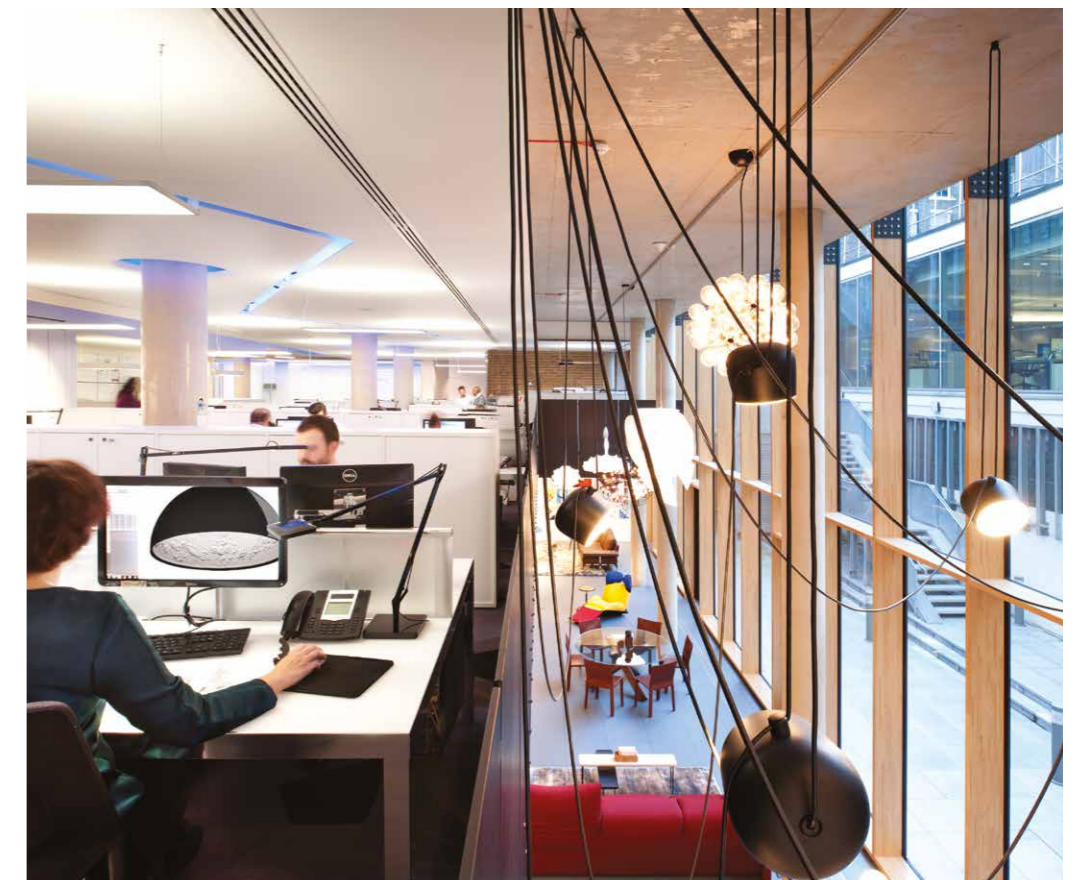
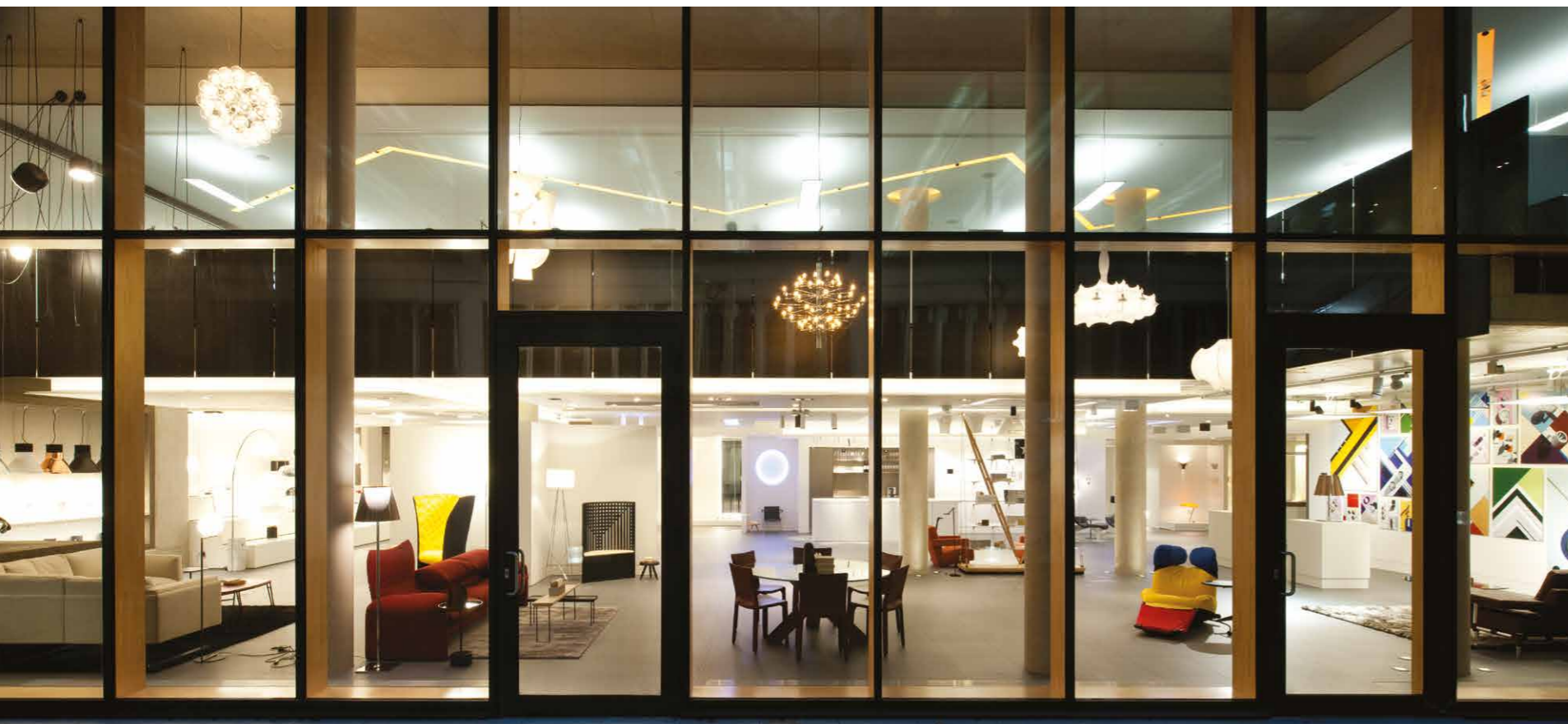
ATRIUM SHOWROOM, LONDON
V&A MUSEUM, LONDON
QATAR NATIONAL CONVENTION CENTRE, DOHA
NATIONAL ARMY MUSEUM, LONDON

ATRIUM SHOWROOM, LONDON

The space accommodates over 40 staff and associated facilities such as a staff kitchen and client meeting spaces, as well as display space for lighting products and solutions.

The showroom can also be used for a number of events and functions utilising a bar area for entertaining and a 50 seat seminar space to be used for talks and presentations.

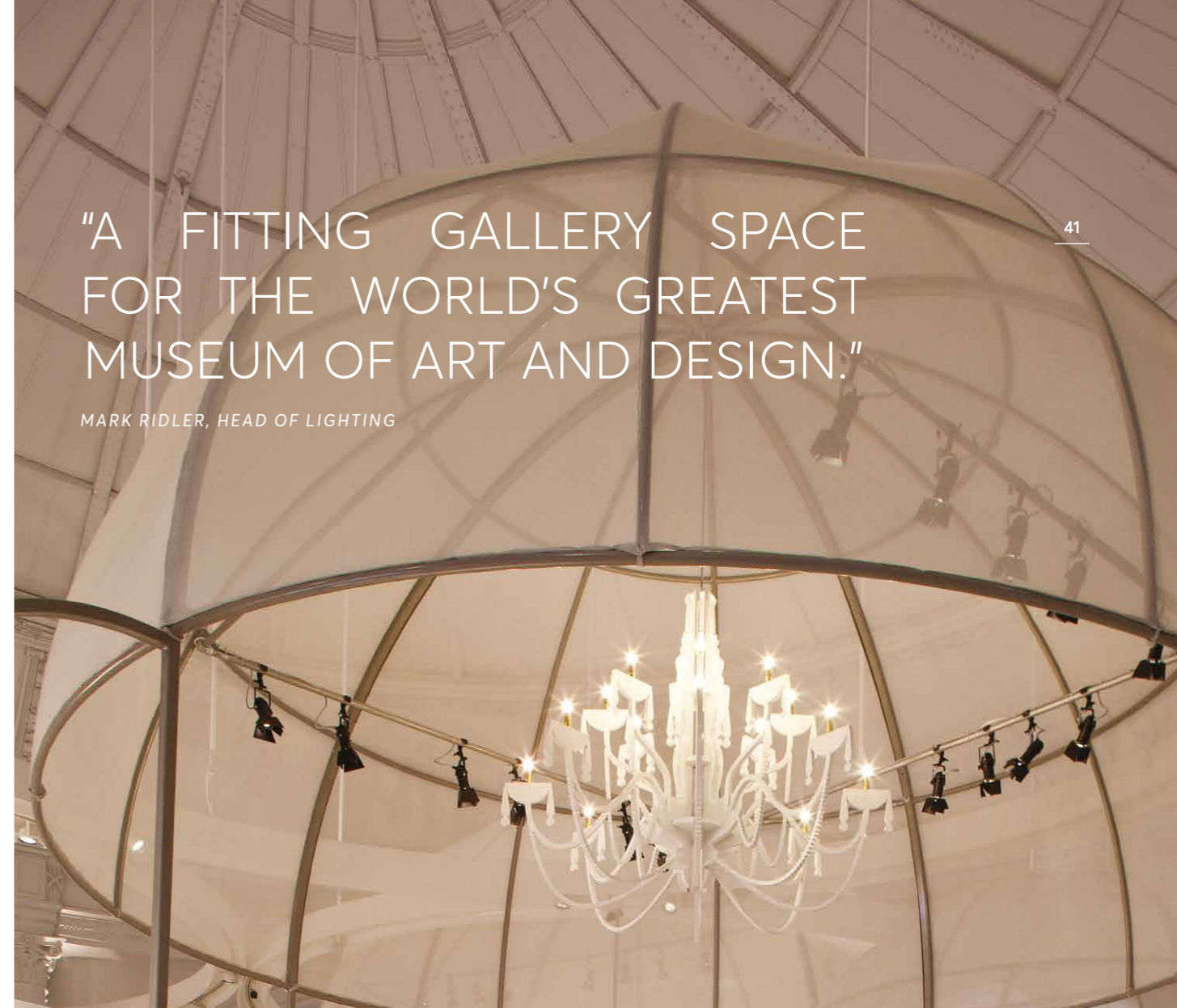
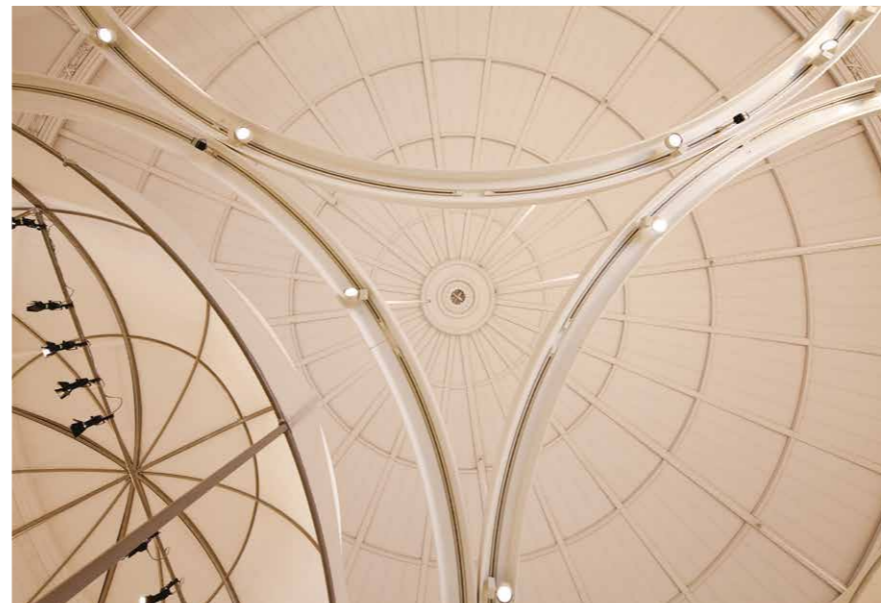
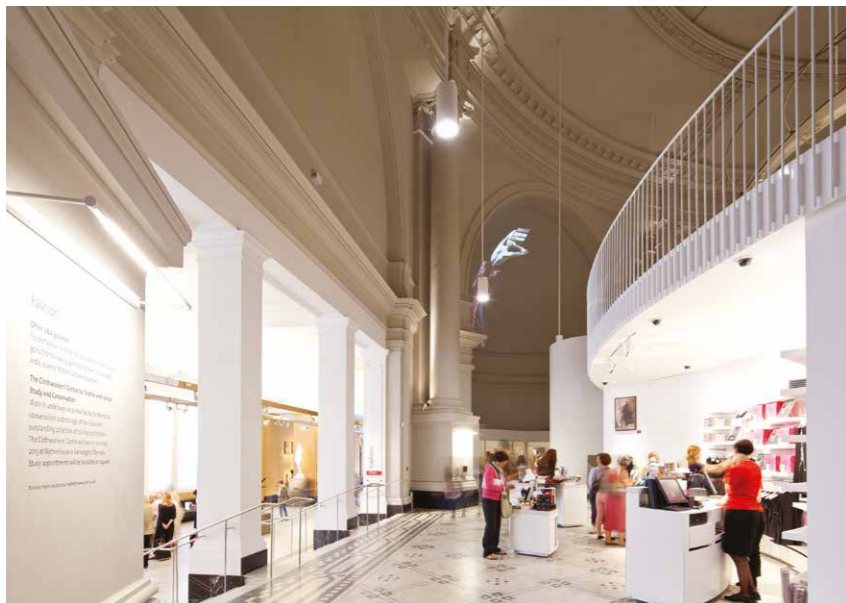
Exposed raw concrete walls and columns were retained in the design, and contrast with the finely engineered lighting products. A dramatic, sculptural stair takes visitors from the ground floor to the showroom.



FASHION ROOM
V&A MUSEUM, LONDON

Architectural sensitivity was key in the lighting intervention; a minimalist approach was favoured by the design team to ensure the architecture was allowed to shine without competition. The lighting was designed to complement, not compete.

One of the main challenges was to uplight the spectacular roof and spotlight to the exhibits on the mezzanine whilst preserving architectural sensitivity. The solution was three custom 9m diameter suspended rings with integrated fluorescent uplighting and custom curved track for spotlighting.



"A FITTING GALLERY SPACE
FOR THE WORLD'S GREATEST
MUSEUM OF ART AND DESIGN."

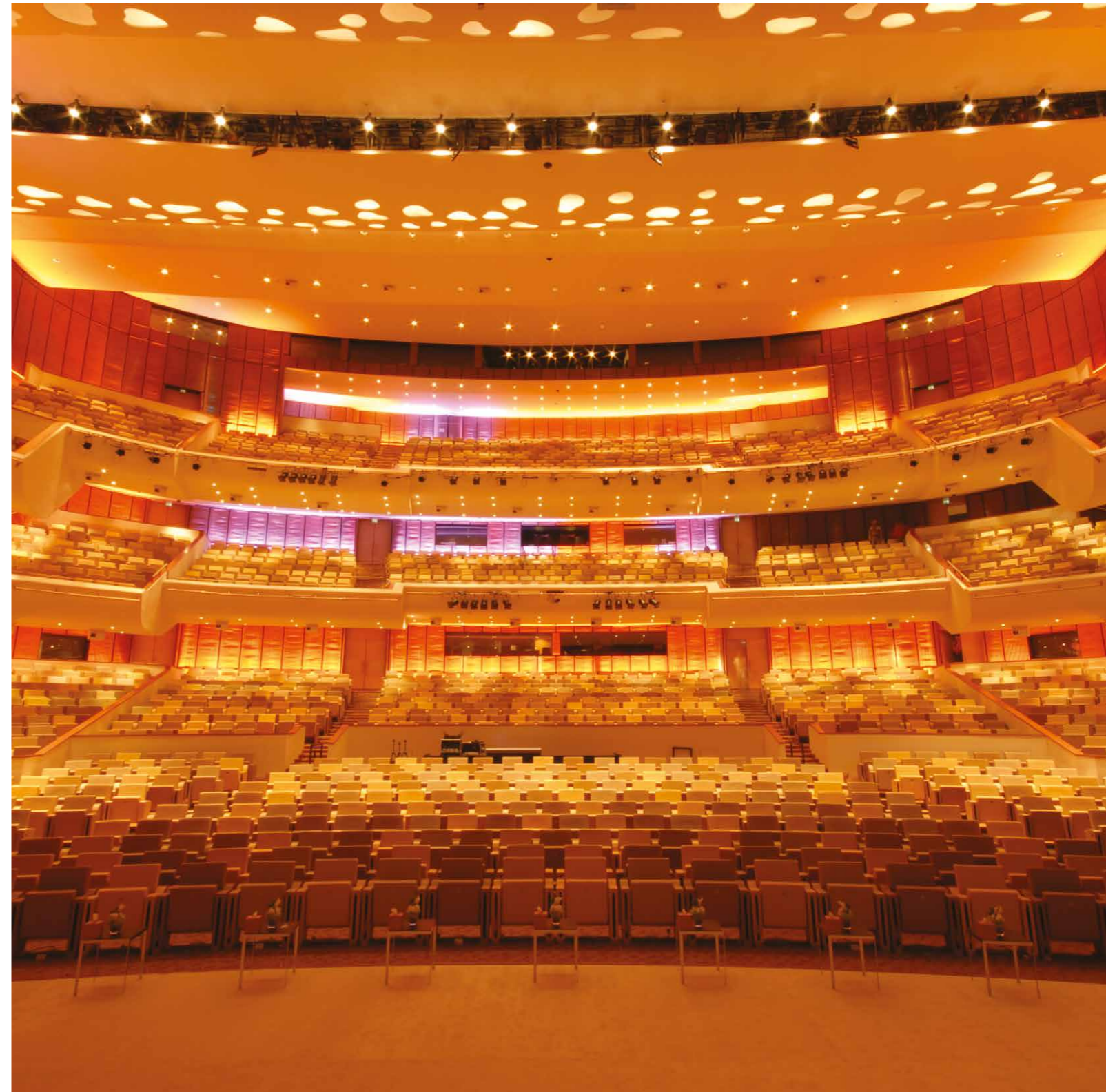
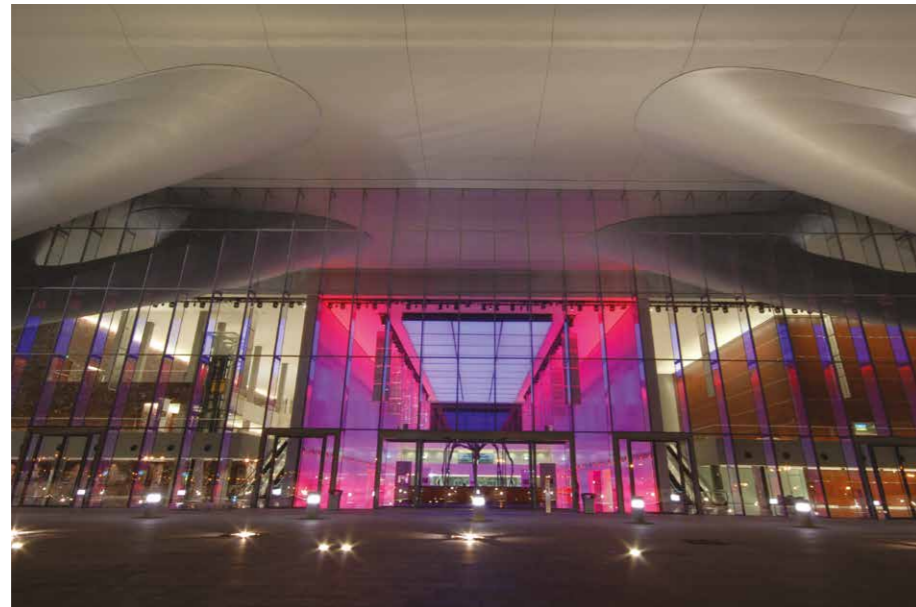
MARK RIDLER, HEAD OF LIGHTING



QATAR NATIONAL CONVENTION CENTRE, DOHA

We provided acoustic consultancy for the QNCC which is located in the new Education City region of Doha. It held its first major conference in December 2011 when it hosted the 20th World Petroleum Congress.

The £700m (\$1.1 billion) development can accommodate 27,000 people at a time, with facilities including a conference hall for 4,600 delegates, 2,232-seat lyric style theatre, three additional tiered auditoria with 300-500 capacity, 40,000 m² of exhibition/banquet space and 57 meeting rooms, all connected by a vast atrium space.



NATIONAL ARMY MUSEUM, LONDON

The National Army Museum sought to re-establish itself as a national museum through the substantial re-ordering of its existing 1970s building, creating physical and intellectually accessible environments together with the provision of new visitor facilities, education spaces, research accommodation and retail and café spaces.

The proposals were supported by significant enhancements to existing accommodation including reception and entrance, café and retail spaces, and cloakroom facilities, and also to the environmental performance of the building to improve energy efficiency and reduce running costs.





INNOVATIVE

The delivery of holistic sustainable design sits at the centre of our design philosophy and our leadership culture. Our engineers constantly push boundaries and innovate to challenge standards including the first BREEAM Outstanding office in the UK as well as the lowest energy primary school in Ireland, and one of the first to achieve BREEAM Outstanding and the Passivhaus standard.

ENTERPRISE CENTRE, UNIVERSITY OF EAST ANGLIA
CARROLL'S FACILITY BUILDING, DUNDALK
UK PAVILION, MILAN EXPO
BIOSPHERIC PROJECT
THE PALACE OF WESTMINSTER

ENTERPRISE CENTRE,
UNIVERSITY OF EAST ANGLIA

Dubbed the UK's greenest building, this project has changed the way the industry thinks about sustainable design and construction.

We engineered this exemplar low carbon building that achieved two of the most rigorous sustainable built environment standards - Passivhaus and BREEAM Outstanding.

Forming a gateway to the university, the building is a hub for joined-up low carbon thinking and acts as stimulation for the regional economy. Local natural materials and products such as Thetford timber, Norfolk straw, hemp and flint are provided by local businesses and craftsmen, finished off with a rainscreen of prefabricated thatch panels and the lecture theatre is constructed from rammed chalk.

The building has won over 30 industry awards, including the Best of the Best at the BCO Awards, CIBSE Project of the Year, and contributed to BDP winning CIBSE Building Performance Consultant of the Year 2018.



"THIS WILL BE A FIRST IN THE UK UNIVERSITY AND BUSINESS SECTORS, FURTHER ADVANCING UEA'S LOW CARBON CREDENTIALS AND SETTING NEW STANDARDS IN BUILDING CONCEPT AND DESIGN THROUGH THE INNOVATIVE USE OF NATURAL MATERIALS AND BIO-BASED PRODUCTS."

PROFESSOR JOHN FRENCH
CEO, ADAPT LOW CARBON GROUP

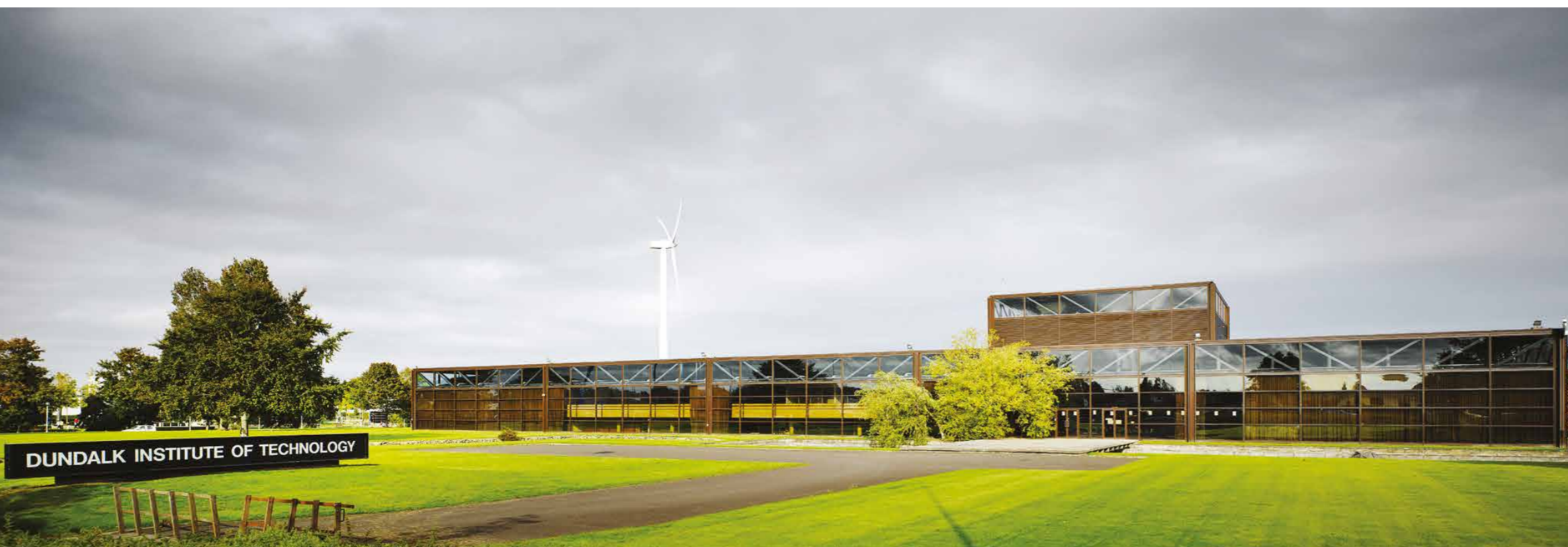
*CARROLL'S FACILITY BUILDING,
DUNDALK INSTITUTE OF TECHNOLOGY*

The P J Carroll's cigarette factory was built in 1967 and stands as one of the best examples of Miesian architecture in Europe.

The design, including the building services installation, was successfully carried out under significant constraints to retain the building's image and its core philosophies of post modernist industrial design.

Innovative sustainable design solutions include the use of the on-site wind turbine to generate ice at night-time, which is then used for daytime cooling.

This project is important because it demonstrates that even the most challenging building can significantly reduce its carbon impact when refurbished. The building demonstrates that air leakage should not be considered too complex an issue to be applied to a refurbishment.



"ARGUABLY IRELAND'S MOST ELEGANT EXAMPLAR OF MODERNISM, THIS BEAUTIFUL BUILDING, ITS ART AND CONSIDERED SETTING HAS BEEN NOT JUST RESTORED BUT RENEWED."

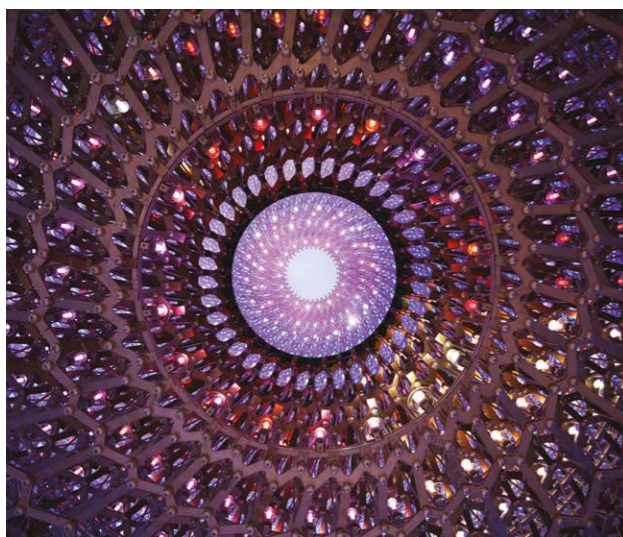
RIAI AWARD JUDGES

UK PAVILION, MILAN EXPO

The UK Pavilion at Milan Expo 2015 took the visitor on an immersive journey through a 40m long British orchard and wildflower meadow, before entering a 14m high 'hive'. A series of landscapes told the story of how Britain contributes world leading solutions to some of today's greatest challenges.

As the average visitor time spent in the pavilion was around three to five minutes it was vital that a single, coherent message ran through the building, landscape, content and digital offer. Our aim was that the pavilion should stand out and be unique, creating a memory and ideally an emotional connection with the UK.

This multi-award winning project now resides in the Royal Botanic Gardens, Kew attracting visitors from all over the world.



BIOSPHERIC PROJECT

Together with industry partners including Siemens and Ener-G, we have been involved in developing detailed designs for a bio-productive climatic façade following a successful funding bid to the UK Technology Strategy Board Greenius Awards. The Biospheric Project is led by the Biospheric Foundation – a group of young researchers who have a vision to change the way cities and communities interact to create a more sustainable way of living.

Set in a disused Salford mill, visitors can see two ingenious indoor aquaponics systems, which use nitrate-rich water from fish tanks to fertilise salad and herb crops, before reusing the water in the tanks. One of the systems pumps water from fish tanks on the first floor to grow leaf crops in rooftop polytunnels. The second is a test bio-productive climatic façade system – a Greenius Wall - designed to maximise bio-productivity by using dormant space on the sides of buildings.



"THE DELIVERY OF HOLISTIC SUSTAINABLE DESIGN SITS AT THE CENTRE OF OUR DESIGN PHILOSOPHY AND OUR LEADERSHIP CULTURE."



INSPIRATIONAL | EVOLUTIONARY | PRODUCTIVE | CREATIVE | INNOVATIVE



THE PALACE OF WESTMINSTER
RESTORATION AND RENEWAL PROGRAMME



Andrew Swain-Smith
PRINCIPAL
Chair, Building Services Engineering

E andrew.swain-smith@bdp.com



David Brennan
PRINCIPAL
Building Services Engineering
Dublin

E david.brennan@bdp.com



James Hepburn
PRINCIPAL
Building Services Engineering
London

E james.hepburn@bdp.com



Rob Ferry
PRINCIPAL
Building Services Engineering
Manchester

E robert.ferry@bdp.com